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EnviroGroup Limited
The environmental solutions company

AS0302

March 16, 2000

Bonnie Lavelle
U.S. Environmental Protection Agency
Region 8
999 - 18th Street, Suite 500
Mail Code 8EPR-SR
Denver, Colorado 80202

RE: Perlite Identification in Soils

Dear Bonnie:

The attached letter from Ron Schott of DCM Sciences Laboratory, Inc., provides comments on the perlite SOP that EPA is following for the VB/I-70 site.

Please call if you have any questions.

Sincerely,
EnviroGroup Limited

David J. Folkes, P.E.
Principal

enc
cc: Bill Brattin, ISSI (w/enc)
Bob Litle, Asarco (w/enc)
Linda Larson, HEWM (w/enc)

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March 15, 2000

Mr. David Folkes
EnviroGroup Ltd.
7208 S. Tuscon Way, Suite 125
Englewood, CO 80112

Dear Dave:

Per your request, I have reviewed the procedures the EPA plans to use to evaluate soil for the presence of perlite. Although I am familiar with microprobe, I lack the expertise to critique the methodology. I can however, give you some insights on the issue of optical microscopy and the identification of perlite.

Perlite Identification

Perlite is readily identifiable using polarized light microscopy techniques. Perlite has a unique morphology and is completely isotropic when observed under crossed polarized light. However, due to the nature of soil samples, interference's can be expected. Grain coating by organic matter and other fine grained materials are the major culprits.

In order to maximize the viewing of individual particles, the soil must be disaggregated as finely as possible without severely reducing the particle size of perlite fragments that may be present. The best way to do this is to remove the larger rock fragments and then mount the soil fraction on a glass slide immersed in 1.550 refractive index liquid. A glass cover slip is then applied and gently rotated to disaggregate the particles. The refractive index liquid also helps in washing off clay/organic material that coats the grains.

The EPA method states that grain mount thin sections will be used for light microscopy analysis. This method should work but care must be taken to thoroughly disperse the soil material. Procedures to minimize overcrowding of the particles should also be utilized. Overcrowding the preparation could potentially mask small perlite shards or other particles of interest.

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The method also states one preparation 1.5 inches in diameter will be made for light microscopy. This may not be adequate. The samples I analyzed for you last year contained very small concentrations of perlite and most of the shards were small. For this reason, up to eight preparations were analyzed. Although more time consuming, viewing numerous preparations greatly enhances the limit of detection.

In conjunction with polarized light microscopy, I would strongly recommend the soils be scanned using a stereomicroscope. As I'm sure you recall, some of the soils analyzed last year contained intact perlite grains up to 2mm in size. Grains of this size can easily be identified using this technique.

I hope this gives you the information you were looking for. If you have any questions or need more information, please call.

Sincerely,

Ron Schott

Ron Schott
Laboratory Director